

## Closure

### Chapter 6

## Closure Definition

- IDEM's written recognition that a party has demonstrated attainment of specific remedial or screening objectives (closure levels) for COCs at a particular area.
- RCRA : series of formal procedures to end operation of a permitted TSD

## Types of Closure

- From the Results of:
  - Closure Sampling
  - Screening
  - Nature and Extent
- Default or Nondefault Closure Levels
- Residential or Industrial Land Use Designation

## Additivity

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Carcinogens               <ul style="list-style-type: none"> <li>– Additive In Surface Soil</li> <li>– Not Additive In Subsurface Soil</li> <li>– Additive In Ground Water If No MCL</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Noncarcinogens               <ul style="list-style-type: none"> <li>– Additive In Surface Soil By Critical Effect</li> <li>– Not Additive In Subsurface Soil</li> <li>– Additive In Ground Water By Critical Effect If No MCL</li> </ul> </li> </ul> |
|--|---|

## Calculating Additive Effects

$$C_1/CL_1 + C_2/CL_2 \dots C_n/CL_n \leq 1.0$$

where C = additive compound  
CL = closure level for compound in numerator

## Closure Without Institutional Controls

- Closure to Residential Levels
  - May Be Default, Nondefault or Background
- Contaminant Concentrations Are Permanently Reduced To Less Than the Closure Levels
- No Industrial Levels, Activity Restrictions, or Engineering Controls Allowed

## Closure With Institutional Controls

- Environmental Notice/Restrictive Covenant
- Industrial Land Use Designation
- Activity Restrictions
- Engineering Controls
  - Post Closure Care / Financial Responsibility
- Can Be Changed To Closure Without Institutional Controls At Any time

## Number Of Sample Locations

<u>Closure Area Size (acres)</u>	<u>#</u>	<u>~ Dimensions</u>
1/10	3	66' x 66'
1/4	5	100' x 100'
1/2	10	150' x 150'

If CV Exceeds 1.2 Additional Measures Are Required

## Potential Exposure Concentrations (PECs)

- The Soil Concentration Used For Comparison To Closure Levels
- Surface Soil - Random
  - Source Area UCL of All Samples with Detections
- Surface Soil - Judgmental
  - Highest Measured Concentration

## Potential Exposure Concentrations (PECs)

- Subsurface Soil - Random
  - UCL of all source area samples with detections
- Subsurface Soil - Judgmental
  - average of 3 highest borings for volatiles
  - average of each detectable sample within each boring for nonvolatiles
    - weighted average if unequal intervals

## Subsurface Soil Sampling Depth

- Either (1) verify two consecutive increments underlying the source area that are below detection limits,
- Or (2) collect samples to depth where concentrations are below land use specific closure level AND collect a ground water sample from each boring

## Ground Water Closure

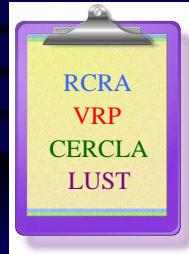


- Closure Without Institutional Controls
  - Must Meet Closure Levels At Each Well
  - 8 Quarters Sample Data Below Closure Levels, or
  - UCL of Quarterly Data For Each Well Below The Closure Levels

## Ground Water Closure

- Plume Stability
  - Plume Must Be Stable Or Shrinking
  - No Closure With An Expanding Plume
    - Expanding Plumes May Be Eligible For Remediation By Natural Attenuation
    - Plume Will Stabilize At Some Future Date
- Nondefault Plume Stability
  - Any Other Method To Demonstrate That the Contaminants Are Not Moving

## Programmatic Closure Considerations



- User's Guide Provides Specific Information
- Closure Care For Engineering Controls
- Financial Responsibility
- Reporting